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Montana Agricultural Experiment Station

Bozeman, Montana

MONTANA WATER SUPPLY OUTLOOK

Snowpack and Streamflow Forecasts as of February 1, 1983

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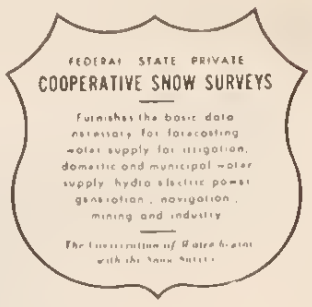
The Montana Water Supply Outlook is a publication of the U.S. Soil Conservation Service. The SCS administers the Cooperative Snow Survey Program in cooperation with other federal, state and private agencies, organizations, and individuals.

The report is prepared by SCS, Snow Survey and Water Supply Forecast Staff, P.O. Box 98, Bozeman, Montana.


FEDERAL STATE PRIVATE
COOPERATIVE SNOW SURVEYS
Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro electric power generation, navigation, mining and industry

January snowfall low

January snowfall was below average in most areas. Storms that usually cross Montana and deposit considerable snow in the mountains have been tracking north and south of this area. The present snowpack varies from above average in the Red Rock River headwaters of southwestern Montana to well below average amounts in the mountain ranges of central Montana.

The northwestern corner of the state, part of the Madison and Ruby River headwaters and the northern end of the Bighorn Mountains have near average snowpack. However, most of the state has below average levels of water stored in the snow. January temperatures were milder than usual with most valley areas and south facing slopes now bare of snow.

Nearly all of the snow measurement sites will be visited near the first of March to obtain a more complete assessment of pending spring and summer water supplies.

Most runoff below average

Most streams are forecast to have below average runoff during spring and summer months. The only areas that can expect near average runoff are in the southwest and northwest corners of the state.

Irrigation water supplies could be quite short if present weather patterns continue.

Hopefully, weather for the next few months will return to a more normal moisture flow and serious water shortages will be avoided.

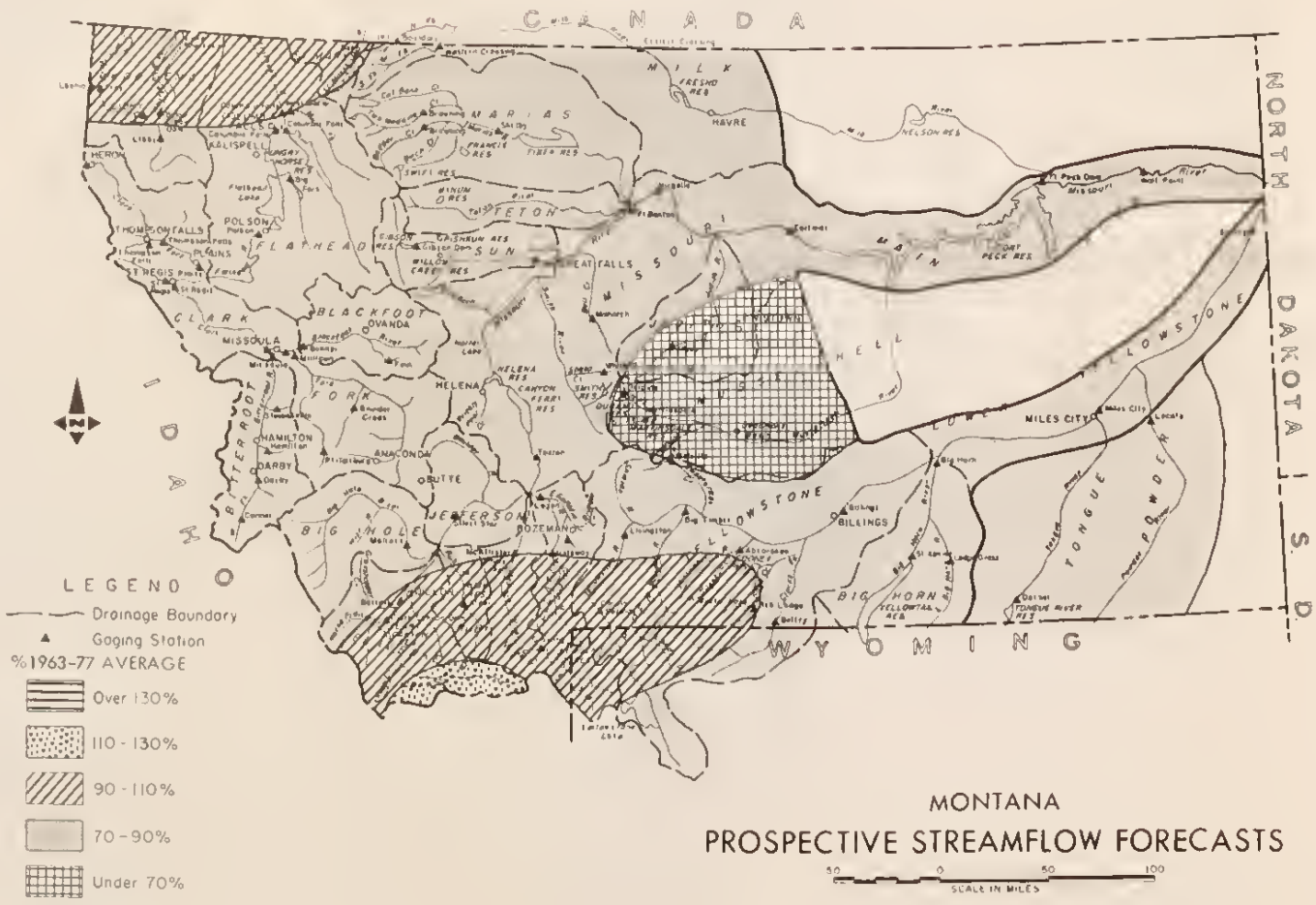
Snow survey program reorganizes

The Snow Survey and Water Supply Forecast function of the Soil Conservation Service is being reorganized. The present 11-state jurisdiction is being consolidated into 5 Data Collection offices. The Montana office will be responsible for snow measurements and field sites in Montana and all of the Missouri and Yellowstone River drainages in northern Wyoming.

Forecasts will continue to be made by the state offices for the next year or two but will eventually be transferred to the new Data Analysis Unit located in Portland, Oregon. In addition to volume forecasts, this Data Analysis group will be developing and implementing hydrograph-type forecasts that will be more useful to all water users.

Interpretations of the water supply, Water Supply Outlook reports and cooperation with local water users will continue to be provided by the Montana Data Collection office. The transfer of all functions is scheduled to take place over the next several years.

Along with the reorganization, there will be more emphasis placed on SNOTEL or automated sites and a reduction in the number of manual measurements. Water users will be contacted as more information becomes available and when plans and schedules materialize.



MONTANA
PROSPECTIVE STREAMFLOW FORECASTS

Yellowstone River Drainage

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	PERIOD	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average
		April - September				April - July			
YELLOWSTONE RIVER at Corwin Springs		1910	91	2497	2,102	1600	91	1978	1,749
YELLOWSTONE RIVER near Livingston		2220	90		2,471	1840	90		2,048
BOULDER RIVER at Big Timber		370	89		416	345	90		382
STILLWATER near Absarokee (1)		595	90		660	500	90		555
CLARKS FORK RIVER near Belfry		572	89		644	505	90		564
ROCK CREEK near Red Lodge		Streamflow measurements			118	discontinued by USGS			91.4
INFLOW COONEY RESERVOIR near Boyd (2)		54.0	84		64.5	44.0	84		52.5
YELLOWSTONE RIVER at Billings		4180	89	5171	4,682	3508	88	4307	3,979
BIGHORN RIVER near St. Xavier (3)		1690	83	2116	2,034	1550	83	1693	1,861
LITTLE BIGHORN RIVER near Hardin		175	89		196	155	89		174
TONGUE RIVER near Decker		225	78		288	205	78		263
YELLOWSTONE RIVER at Miles City (4)		5825	82		7,142	5120	82		6,243
POWDER RIVER at Moorhead		200	79		253	185	79		234
YELLOWSTONE RIVER near Sidney (5)		6340	81		7,806	5530	81		6,805

(1) Adjusted for storage in Mystic Lake.
(2) Adjusted for storage in Cooney Reservoir.
(3) Adjusted for storage in Buffalo Bill, Boysen, Bull Lake, Pilot Butte and Bighorn Reservoirs.
(4) Adjusted for storage in Bull Lake, Buffalo Bill, Boysen, Pilot Butte, Bighorn and Tongue River Reservoirs.
(5) Adjusted for reservoirs shown in (4) and diversions into the Lower Yellowstone Canal.

ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

Snow cover on exposed ridges and in valley areas throughout the Yellowstone River headwaters is sparce.

SUMMARY of SNOW MEASUREMENTS
(COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN and/or SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF Last Year	THIS YEAR'S SNOW WATER AS PERCENT OF Average
Upper Yellowstone ab Livingston ..	11	75	79
Shields	4	73	63
Boulder & Stillwater	1	94	69
Rock Creek & Clark's Fork ...	9	93	84
Yellowstone (ab Bighorn River) .	25	81	78
Bighorn/Wyoming .	28	77	84
Little Bighorn ..	3	108	88
Bighorn (Total) .	31	79	84
Tongue	9	119	96
Powder	7	103	100
Yellowstone (Total)	72	85	83

Present snowpack poor

Snowfall was below average over the entire drainage last month. With the exception of the northern Bighorn Mountains, snowpack over all of the Yellowstone River headwaters is now below to well below average. Snow in the valleys as well as some foothill areas and south facing slopes has disappeared due to warmer than normal temperatures and lack of new snowfall.

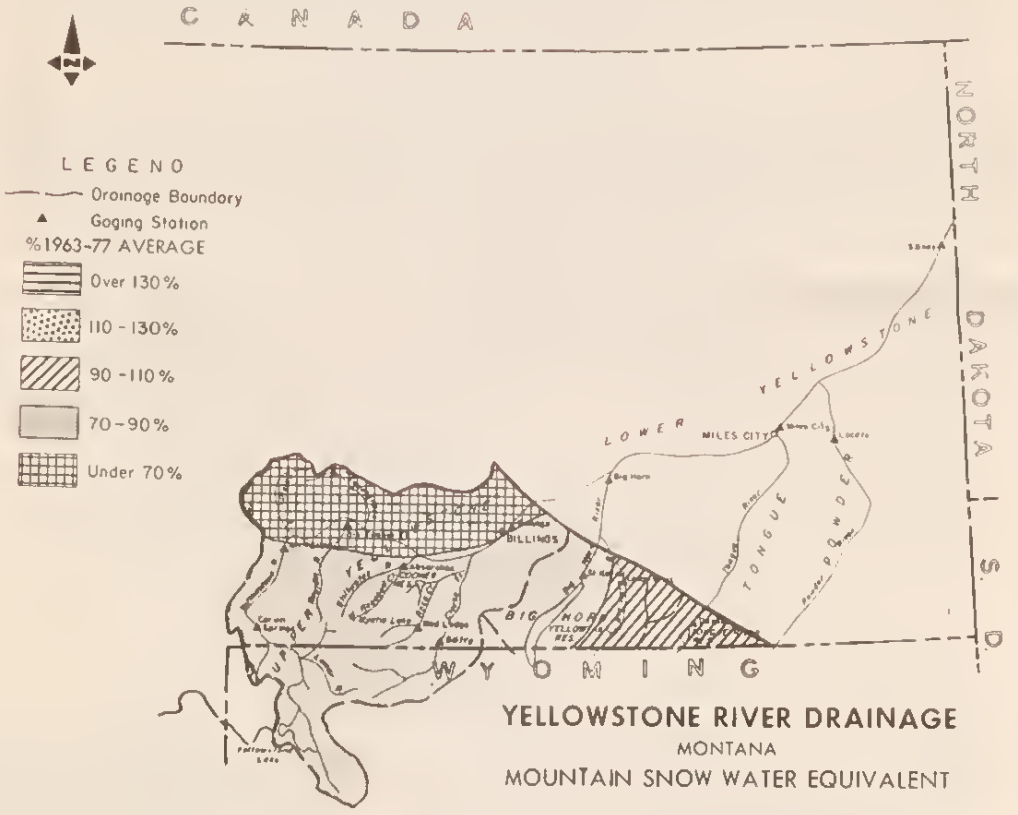
Forecasts below average

Runoff this spring and summer is forecast to be between 80 and 90 percent of average for most drainages in the Yellowstone River system. However, mountain precipitation must return to near or above average levels or shortages of irrigation water supplies can be expected later this season.

WATER SUPPLY OUTLOOK

Expressed as "Poor, Fair, Average, Excellent" With Respect to Usual Supply

STREAM or AREA	Flow Period: Spring Season	Flow Period: Late Season
Yellowstone at Livingston	Avg	Fair
Shields	Fair	Fair
Boulder	Fair	Fair
Sweetgrass - Big Timber	Fair	Fair
Stillwater	Fair	Fair
Rock Creek	Avg	Fair
Clark's Fork	Fair	Fair
Yellowstone above Bighorn	Fair	Fair
Bighorn	Avg	Avg
Little Bighorn	Fair	Fair
Tongue	Fair	Fair
Powder	Fair	Fair
Lower Yellowstone ...	Fair	Fair



Source: NWS
Great Falls, MT

SNOW SURVEY DATA

SNOW February 1, 1983

DRAINAGE BASIN and/or SNOW COURSE NAME	Elevation	THIS YEAR Date of Survey	Snow Depth (inches)	Water Content (inches)	PAST RECORD Water Content (inches) Last Year	Average
ARCH FALLS	7250	1/24	22	5.5	7.0	9.1
ASHLEY DIVIDE	4820	1/28	21	4.6	7.0	-
ASHLEY LAKE	4060	1/28	17	3.0	5.4	-
BADGER PASS	6910	2/03	54	19.0A	22.0	20.5
BADGER PASS PILLOW	6900	2/01	SP	17.0	24.6	-
BANFIELD MOUNTAIN	5600	1/28	50	14.7	15.4	18.2
BANFIELD MOUNTAIN PILLOW	5600	1/28	SP	15.2	15.2	15.2
BARKER LAKES PILLOW	8250	2/01	SP	14.0	10.2	-
BASIN CREEK	7180	1/27	26	7.0	8.0	-
BASIN CREEK PILLOW	7140	2/01	SP	5.4	6.3	-
BEAGLE SPRINGS PILLOW	8850	2/01	SP	4.7	6.0	-
BEAR PAW SKI AREA	5200	1/28	14	3.5	3.4	4.6
BIG COULEE	5100	1/27	14	3.6	-	4.9
BIG SKY	7200	2/01	33	0.6	-	10.2
BLACK BEAR	7950	1/27	82	29.1	25.6	27.4
BLACK BEAR PILLOW	7950	1/27	SP	25.1	31.2	25.0
BLACK PINE	7100	1/25	24	6.4	10.2	9.4
BLACK PINE PILLOW	7100	1/25	SP	6.6	12.8	10.7
BLOODY DICK PILLOW	7600	2/01	SP	6.2	11.6	-
BLUE LAKE	5900	2/02	46	14.0A	20.5	18.2
BOULDER MOUNTAIN PILLOW	7950	2/01	SP	12.2	16.4	-
BOX CANYON PILLOW	6670	2/01	SP	4.9	6.9	-
BRIDGER BOWL	7250	1/25	30	12.2	17.1	20.0
BRIDGER BOWL PILLOW	7250	1/25	SP	10.2	16.2	18.0
BULL MOUNTAIN	6600	1/27	19	4.0	-	4.2
CALVERT CREEK PILLOW	6450	2/01	SP	4.9	9.8	7.7
CARROT BASIN	9000	1/31	69	25.1	28.0	26.7
CARROT BASIN PILLOW	9000	1/31	SP	19.2	20.5	19.7
CARTER CREEK	7400	1/31	18	4.2	-	4.0
CASHE CREEK PILLOW	7800	2/01	SP	6.8	6.2	-
CEDAR GROVE	4100	1/28	25	8.4	-	9.0
CHESSMAN RESERVOIR	6200	1/26	17	4.2	2.9	2.8
CHICKEN CREEK	4060	1/27	34	9.6	11.1	-
CLOVER MEADOW PILLOW	8600	2/01	SP	9.3	12.0	-
COLE CREEK	7850	1/28	35	10.2	8.8	12.5
COLE CREEK PILLOW	7850	1/28	SP	11.1	8.1	12.2
COMBINATION	5600	1/25	15	3.4	4.8	4.2
COMBINATION PILLOW	5600	1/25	SP	3.9	5.1	6.4
COPPER BOTTOM PILLOW	5200	2/01	SP	7.1	10.4	10.5
COPPER CAMP PILLOW	6950	2/01	SP	17.6	25.0	30.0
COPPER MOUNTAIN	7200	1/28	27	6.2	8.6	8.0
COYOTE HILL	4200	1/28	26	6.0	8.6	8.1
CRYSTAL LAKE PILLOW	6100	2/01	SP	6.5	8.5	-
DAISY PEAK	7600	1/26	25	6.0	8.2	-
DALY CREEK PILLOW	5780	2/01	SP	7.4	10.2	-
DARKHORSE LAKE PILLOW	8600	2/01	SP	11.5	22.0	-
DEADMAN CREEK PILLOW	6650	2/01	SP	5.2	8.1	8.2
DESERT MOUNTAIN	5600	1/25	27	10.1	10.9	11.6
DEVILS SLIDE	8100	1/26	33	11.8	15.4	15.6
DISCOVERY BASIN	7050	1/25	26	6.4	8.8	8.1
DIVIDE PILLOW	7900	2/01	SP	8.4	9.0	7.7
DIX HILL	6400	1/30	24	6.2	9.8	8.2

SNOW February 1, 1983

DRAINAGE BASIN and/or SNOW COURSE NAME	Elevation	THIS YEAR Date of Survey	Snow Depth (inches)	Water Content (inches)	PAST RECORD Water Content (inches) Last Year	Average
MONUMENT PEAK PILLOW	8800	2/01	SP	11.0	16.5	-
MOULTON RESERVOIR	6850	1/28	22	4.0	5.9	-
MOUNT LOCKHART PILLOW	6400	2/01	SP	10.9	16.4	14.9
MULE CREEK PILLOW	8350	2/01	SP	7.9	-	-
NEVADA CR. FK. PILLOW	6490	2/01	SP	7.0	10.9	-
NEW WORLD	6700	1/25	27	7.5	9.6	10.7
NEWT'S MOUNTAIN	5600	2/01	27	28.0	23.2	-
NEZ PERCE CAMP PILLOW	5450	2/01	SP	9.3	13.3	-
NEZ PERCE CREEK	6510	1/28	19	3.9	5.2	5.5
NOISY BASIN	6040	1/25	86	29.6	28.3	30.8
NOISY BASIN PILLOW	6040	1/25	SP	26.9	25.1	26.4
NORTH FK. ELK CREEK	6250	1/29	27	7.2	10.3	9.2
NORTH FK. ELK CREEK PILLOW	6250	1/29	SP	6.6	10.9	9.3
NORTH FORK JOCKO	6330	2/03	28	28.1	30.4	-
NORTHEAST ENTRANCE	7400	1/27	24	6.6	7.5	7.4
NORTHEAST ENTRANCE PILLOW	7400	1/27	SP	5.8	7.0	7.2
OPHIR PARK	7150	1/30	36	10.6	13.8	14.2
PETERSON MEADOWS	7200	1/31	24	5.2	7.0	7.1
PETERSON MEADOWS PILLOW	7200	1/31	SP	6.0	6.7	7.1
PICKFOOT CREEK PILLOW	6650	2/01	SP	6.6	9.5	-
PIPESTONE PASS	7200	1/28	14	3.2	3.0	3.9
PLACER BASIN PILLOW	8930	2/01	SP	8.4	8.5	-
POORMAN CREEK	5100	1/28	40	22.0	21.1	25.6
POORMAN CREEK PILLOW	5100	1/28	SP	22.1	23.9	22.7
PORCUPINE PILLOW	6500	2/01	SP	4.2	5.1	-
RED TOP	5260	2/01	46	24.4	18.9	-
ROCKER PEAK PILLOW	9060	2/01	SP	8.2	12.0	11.0
ROCKY BOY	4700	1/28	11	3.0	2.4	3.4
ROCKY BOY PILLOW	4700	1/28	SP	3.3	3.7	3.5
SADDLE MOUNTAIN	7940	1/27	55	18.0	22.6	18.9
SADDLE MOUNTAIN PILLOW	7940	1/27	SP	16.9	23.3	19.5
SAND BASIN LOWER	6480	2/01	31	8.0	-	-
SHOWER FALLS	8100	1/26	40	12.9	16.4	17.5
SHOWER FALLS PILLOW	8100	2/01	SP	12.9	16.6	17.0
SILVER RUN	6630	1/28	13	2.9	-	-
SILVER RUN PILLOW	6630	1/28	SP	2.2	1.9	-
SKALKAHO SUMMIT PILLOW	7260	2/01	SP	14.0	22.6	-
SKYLARK TRAIL PILLOW	6200	2/01	SP	17.7	24.3	-
SPOTTED BEAR MOUNTAIN	7000	1/25	31	8.6	10.2	11.2
SPUR PARK PILLOW	8100	2/01	SP	10.2	17.7	16.5
STAHL PEAK	6050	1/28	84	26.6	20.8	31.0
STAHL PEAK PILLOW	6050	1/28	SP	24.5	22.2	24.1
STORM LAKE	7780	1/31	35	9.8	7.9	9.6
STRYKER BASIN	6180	1/27	66	22.4	19.7	-
STUART MILL	6510	1/27	19	3.9	4.7	4.9
STUART MOUNTAIN	7400	1/30	57	19.2	23.6	23.9
SUCKER CREEK	3960	1/29	2	.2	.0	0.6
TAYLOR ROAD	4080	1/29	3	.6	2.6	2.7
TEN MILE LOWER	6600	1/25	22	5.8	4.4	5.5
TEN MILE MIDDLE	6800	1/25	27	6.9	7.9	8.2
TEN MILE UPPER	8000	1/25	29	7.6	9.5	10.2
TERRY CREEK PILLOW	8000	2/01	50	8.0	9.7	9.1
TRINITY LAKE	6100	1/25	71	24.2	29.2	-
TRUMAN CREEK	4060	1/28	9	2.6	3.8	-
TV MOUNTAIN	6800	1/30	36	11.3	12.6	13.2
TWELVEMILE CREEK PILLOW	5600	2/01	SP	10.1	19.1	14.4
TWENTY-ONE MILE	7150	1/28	40	11.0	10.5	13.6
TWO CREEKS	3540	2/13	27	7.5A	12.0	8.9
TWIN LAKES PILLOW	6510	2/01	SP	28.0	35.3	30.7

SNOW February 1, 1983

DRAINAGE BASIN and/or SNOW COURSE NAME	Elevation	THIS YEAR Date of Survey	Snow Depth (inches)	Water Content (inches)	PAST RECORD Water Content (inches) Last Year	Average
EMERY CREEK	4350	1/25	44	12.2	12.4	11.9
EMERY CREEK PILLOW	4350	1/25	SP	12.1	11.9	-
FISH CREEK	8000	1/27	28	8.0	9.6	-
FISHER CREEK PILLOW	9100	2/01	SP	28.3	27.2	24.6
FLATTOP MOUNTAIN PILLOW	6300	2/01	SP	32.2	30.4	35.2
FLEECER RIDGE	7500	1/27	24	6.0	9.6	9.3
FOURTH OF JULY	3450	2/01	28	7.4	7.4	-
FRIDAY HILL	4620	2/01	55	18.5	14.8	-
FROHNER MEADOWS	6480	1/26	23	6.0	5.5	6.2
FROHNER MEADOWS PILLOW	6480	1/26	SP	5.2	5.9	6.5
GARVER CREEK	4250	1/28	33	8.9	8.2	9.1
GARVER CREEK PILLOW	4250	1/28	SP	8.2	7.0	8.1
GIBBONS PASS	7100	1/27	55	17.9	20.4	16.7
GRAVE CREEK	4300	1/28	47	14.4	11.0	13.7
GRAVE CREEK PILLOW	4300	1/28	SP	15.4	12.0	13.5
GRIZZLY PEAK	8640	1/28	35	10.4	7.6	10.9
HAND CREEK PILLOW	5030	2/01	SP	10.6	11.0	-
HAWKINS LAKE	6450	1/28	74	24.6	18.8	22.0
HAWKINS LAKE PILLOW	6450	1/28	SP	21.8	19.2	22.1
HEART LAKE TRAIL	4800	1/28	39	12.5	16.3	12.8
HEDGEN DAM	6550	1/28	38	9.5	9.4	8.9
HELL ROARING DIVIDE	5770	1/29	63	20.1	17.3	23.3
HERRIS JUNCTION	4850	1/27	60	19.1	18.5	-
HIGHWOOD DIVIDE	5650	1/28	21	5.3	-	7.5
HIGHWOOD STATION	4600	1/27	9	2.4	-	4.2
HOLBROOK	4530	2/03	25	6.0A	11.0	7.7
HOOD MEADOW	6600	1/26	19	5.2	7.1	8.1
HOODOO BASIN	6000	1/28	80	33.7	32.2	36.3
HOODOO BASIN PILLOW	6000	2/01	SP	27.6	32.4	34.6
HOODOO CREEK	5900	1/29	84	31.2	33.0	32.5
INTERGAARD	6450	1/27	19	4.1	5.8	6.2
JOHNSON PARK	6450	1/26	16	3.4	5.3	-
KINGS HILL	7500	1/26	26	6.6	10.6	10.8
KIWANIS CAMP	3220	1/28	3	.6	2.1	1.3
KRAFT CREEK PILLOW	4750	2/01	SP	9.3	12.6	-
LAKEVIEW CANYON	6930	1/29	38	11.8	5.9	9.1
LAKEVIEW RIDGE	7400	1/28	36	10.4	5.6	8.3
LAKEVIEW RIDGE PILLOW	7400	2/01	SP	11.4	6.6	-
LEMHI RIDGE PILLOW	8110	2/01	SP	4.8	8.7	7.0
LICK CREEK	6870	1/26	20	5.1	6.2	7.1
LICK CREEK PILLOW	6860	1/26	SP	4.2	7.2	6.4
LONE MOUNTAIN	8800	2/01	46	14.8	-	16.8
LOWER TWIN PILLOW	7900	2/01	SP	14.8	15.0	-
LUBRECHT FLUME	4800	1/29	15	3.9	6.5	4.5
LUBRECHT FOREST # 3	5450	1/31	17	3.3	7.5	5.9
LUBRECHT FOREST # 4	4650	1/31	8	2.1	4.4	3.1
LUBRECHT FOREST # 5	4740	1/31	8	2.4	5.4	3.5
LUBRECHT HYDROPLOT	4200	1/29	16	4.0	6.5	5.1
MADISON PLATEAU	7750	1/27	53	16.2	17.1	15.6
MADISON PLATEAU PILLOW	7750	1/27	SP	15.9	18.4	16.5
MANY GLACIER	4960	1/29	47	15.1	15.9	-
MANY GLACIER PILLOW	4960	2/01	SP	13.0	13.4	-
MARIAS PASS	5250	1/31	38	11.9	15.3	12.9
MAYNARD CREEK	6210	1/25	28	7.7	8.3	10.1
MAYNARD CREEK PILLOW	6210	1/25	SP	6.0	7.4	9.5

SNOW February 1, 1983

DRAINAGE BASIN and/or SNOW COURSE NAME	Elevation	THIS YEAR Date of Survey	Snow Depth (inches)	Water Content (inches)	PAST RECORD Water Content (inches) Last Year	Average
UPPER HOLLAND LAKE	6200	1/30	57	21.2	22.8	-
WALDRON PILLOW	5600	2/01	SP	5.9	8.2	8.4
WARM SPRINGS PILLOW	7800	2/01	SP	11.7	18.4	-
WEASEL DIVIDE	5450	1/28	80	25.8	19.7	26.8
WEST ROSEBUD	7500	1/26	18	5.1	5.4	7.3
WEST YELLOWSTONE	6700	1/29	34	8.2	7.3	8.9
WEST YELLOWSTONE PILLOW	6700	1/28	SP	6.9	7.1	6.6
WHISKEY CREEK	6800	1/27	49	15.6	16.8	13.5
WHISKEY CREEK PILLOW	6800	1/27	SP	11.6	13.1	11.6
WHITE MILL PILLOW	8700	2/01	SP	16.5	19.1	17.8
WILLOW CREEK	6500	1/28	22	4.6	4.1	7.3
WOOD CREEK PILLOW	5960	2/01	SP	5.3	6.4	-
BEAR MOUNTAIN PILLOW (ID)	5400	2/01	SP	49.2	47.2	-
BIG SPRINGS (ID)	6510	1/29	47	14.9	16.1	14.7
CEDAR CREEK PILLOW (ID)	6960	2/01	SP	15.4	-	-
ISLAND PARK (ID)	6290	1/28	45	13.9	13.4	12.0
ISLAND PARK PILLOW (ID)	6290	2/01	SP	12.5	13.1	-
KILGORE (ID)	6320	1/29	38	10.9	8.4	8.6
LOLO PASS (ID)	5230	1/27	51	15.3	23.4	21.8
LOOKOUT (ID)	5250	1/31	67	22.0	21.8	25.4
LOOKOUT PILLOW (ID)	5250	2/01	SP	22.6	21.0	-
MOOSE CREEK (ID)	6200	1/28	44	13.0	12.6	12.6
MOOSE CREEK PILLOW (ID)	6200	2/01	SP	12.5	17.0	-
SAVAGE PASS (ID)	6170	1/27	49	14.9	22.2	19.1
SAWTELL MOUNTAIN (ID)	8220	1/28	79	30.1	28.7	22.8
TARGHEE PASS (ID)	6980	1/28	36	10.1	10.2	10.5
VALLEY VIEW (ID)	6680	1/28	43	13.9	11.2	12.5
WHITE ELEPHANT (ID)	7710	1/28	58	18.8	19.2	13.2
BALD MOUNTAIN (WY)	9380	1/26	59	14.9	13.2	15.1
BALD MOUNTAIN PILLOW (WY)	9390	1/26	SP	13.5	12.5	-
BEARTOOTH LAKE PILLOW (WY)	9270	2/01	SP	13.4	16.3	-
BURGESS R.S. (WY)	7990	1/26	21	4.7	4.1	5.4
BURGESS R.S. PILLOW (WY)	7880	1/26	SP	7.5	5.4	-
CANYON PILLOW (WY)	7940	1/24	SP	7.2	13.6	-
EAST ENTRANCE (WY)	6960	2/01	30	6.9	12.0	7.6
EVENING STAR PILLOW (WY)	9210	2/01	SP	9.9	-	-
FIVE SPRINGS FALLS (WY)	7620	1/31	17	3.4	3.7	5.7
LAKE CAMP (WY)	7780	1/27	25	5.1	8.2	6.6
LUPINE CREEK (WY)	7780	2/02	27	5.5	7.0	7.9
NORRIS BASIN (WY)	7500	2/02	27	6.1	9.6	9.6
OLD FAITHFUL (WY)	7400	2/01	38	10.0	11.5	-
PARKERS PEAK PILLOW (WY)	9400	2/01	SP	14.4	20.0	-
SYLVAN PASS (WY)	7100	2/01	33	8.6	13.5	10.0
THREE DIVIDE (WY)	7980	1/27	41	12.2	16.3	15.1
TOGWOTEE PASS (WY)	9580	1/29	62	18.2	26.3	20.1
TROUT CREEK PILLOW (WY)	8400	1/31	SP	3.6	-	-
WOLVERINE (WY)	7450	1/29	32	8.6	11.6	9.3
WOLVERINE PILLOW (WY)	7650	1/29	SP	7.6	10.2	-
YOUNTS PEAK PILLOW (WY)	8350	1/31	SP	9.9	18.2	-

Average based on 1963-77 period. A – Aerial observation; water content estimated.
SP – Snow Pillow observations; water content only. * Estimated from SNOTEL.

Columbia River Drainage

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average
PERIOD	April - September				April - July				April - June			
KOOTENAI RIVER below Libby Dam (1)	6,840	94	7,017	7,246	5,830	94	5,878	6,178				
FISHER RIVER near Libby	230	85		270	215	85		253				
YAAK RIVER near Troy	484	90		537	462	90		514				
KOOTENAI RIVER at Leonia (1)	8,700	98	8,643	8,883	7,570	98	7,413	7,727	6,030	98	5,921	6,150
INFLOW MOULTON RESERVOIR nr BUTTE (Million Gallons)					230	80	360	286	210	81	328	260
WARM SPRINGS CREEK AT MEYERS DAM near Anaconda (2)	45.0	89		50.7	37.0	90		41.2				
FLINT CREEK near Southern Cross (3)	15.2	82	24.6	18.5	12.6	82	20.0	15.4				
FLINT CREEK below Boulder Creek (4)	63.0	81		77.6	49.8	81		61.3				
INFLOW LOWER WILLOW CREEK RESERVOIR near Hall (5)	12.0	71	15.9	16.9	11.3	71	15.1	16.0				
MIDDLE FORK ROCK CREEK near Philipsburg	69.7	88		78.8	63.0	89		71.1				
NEVADA CREEK near Finn	16.5	70		23.6	15.2	70		21.8				
BLACKFOOT RIVER near Bonner	800	79		1,017	720	78		920	620	78		794
CLARK FORK RIVER above Milltown (6)	750	89		843	655	90		730	550	90		613
CLARK FORK RIVER above Missoula	1,550	83	2,260	1,859	1,375	83	2,038	1,651	1,170	83	1,645	1,408
WEST FORK BITTERROOT RIVER near Conner (7)	157	84		187	145	84		172				
BITTERROOT RIVER near Darby	515	86		602	475	86		552	412	86		480
SKALKAHO CREEK near Hamilton	51.0	89		57.4	44.6	90		49.8				
BURNT FORK CREEK near Stevensville (8)	34.1	88		38.8	29.8	88		33.6				
BITTERROOT RIVER at Missoula (9)	1,310	85		1,543	1,205	85		1,416	1,040	86		1,211
CLARK FORK RIVER below Missoula	2,860	84		3,405	2,580	84		3,069	2,210	84		2,618
CLARK FORK RIVER at St. Regis	3,760	83	5,715	4,521	3,390	83	5,292	4,078	2,900	83	4,309	3,492
NORTH FORK FLATHEAD RIVER near Columbia Falls	1,850	94		1,969	1,680	94		1,782	1,410	94		1,498
MIDDLE FORK FLATHEAD RIVER near West Glacier	1,670	87	2,083	1,911	1,520	87	1,925	1,750	1,310	89	1,544	1,470
SOUTH FORK FLATHEAD RIVER near Columbia Falls (10)	1,965	85	2,559	2,302	1,835	85	2,428	2,159	1,600	85	2,034	1,884
FLATHEAD RIVER at Columbia Falls (10)	5,650	89	6,549	6,330	5,200	89	6,080	5,827	4,400	89	4,990	4,964
SWAN RIVER near Big Fork	570	84		681	500	84		596				
FLATHEAD RIVER near Polson (11)	6,600	89	8,005	7,394	6,060	89	7,323	6,806	5,150	89	5,910	5,779
CLARK FORK RIVER near Plains (11)	10,600	86	14,103	12,340	9,640	86	12,939	11,222	8,180	86	10,447	9,507
THOMPSON RIVER near Thompson Falls	235	89		263	210	90		234				
PROSPECT CREEK at Thompson Falls	128	90		143	120	90		133				
CLARK FORK RIVER at Whitehorse Rapids (12)	11,900	86		13,781	10,800	86		12,519	9,150	86		10,633

(1) Adjusted for storage in Lake Koocanusa
(2) Adjusted for storage in Silver Lake, diversions to and pumping from Georgetown Lake.
(3) Adjusted for storage in Georgetown Lake, diversions from and pumping to Silver Lake.
(4) Sum Flint Creek at Maxville and Boulder Creek at Maxville.
(5) Sum of North Fork Lower Willow Creek near Hall and South Fork Lower Willow Creek near Hall.
(6) Difference in observed flow Clark Fork above Missoula and Blackfoot near Bonner
(7) Adjusted for storage in Painted Rocks Reservoir
(8) Adjusted for diversion into Sunset Highline Canal.
(9) Difference in observed flow Clark Fork above and below Missoula.
(10) Adjusted for storage in Hungry Horse Reservoir.
(11) Adjusted for storage in Hungry Horse Reservoir and Flathead Lake.
(12) Adjusted for storage in Hungry Horse Reservoir, Flathead Lake and Noxon Rapids Reservoir.

ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

WATER SUPPLY OUTLOOK

Expressed as "Poor, Fair, Average Except" With Respect to Usual Supply

STREAM or AREA	Flow Period: Spring Season	Flow Period: Late Season
Tobacco	Avg	Avg
Little Bitterroot	Avg	Avg
Mission Valley	Avg	Avg
Flint Creek	Fair	Fair
Upper Clark Fork	Fair	Fair
Nevada Creek	Poor	Poor
Blackfoot	Fair	Poor
West-side Bitterroot	Fair	Fair
East-side Bitterroot	Fair	Fair
Bitterroot River	Fair	Fair
Lower Clark Fork	Fair	Fair

Southern areas face shortages

Streams in the southern area are forecast in the 70 to 80 percent of average range, while those in the northern part are expected to have spring and summer runoff in the 85 to 90 percent range. Some shortages of irrigation water supplies can be expected on most streams that do not have stored water. If present weather patterns continue, severe shortages can be anticipated.

Snow better in north

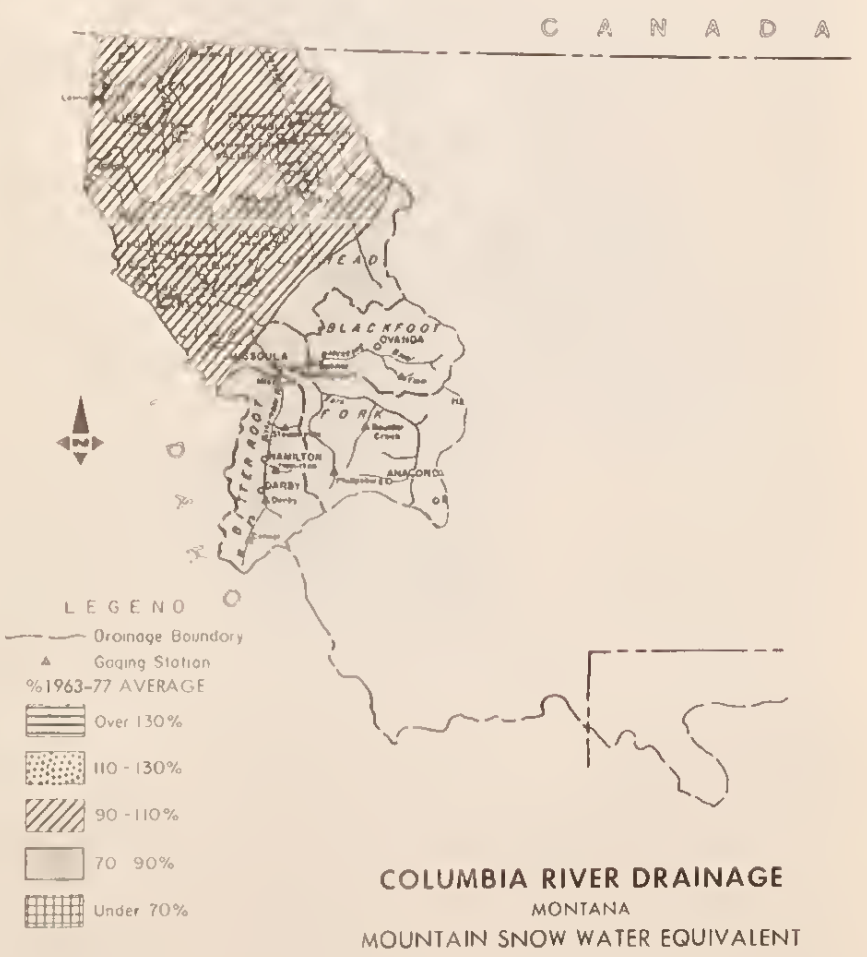
The northwest part of the drainage has received good mountain moisture during January with some locations doubling their water content of last month. More southerly areas had below average snowfall and most of this area has below average water stored in the snowpack.

SUMMARY of SNOW MEASUREMENTS

(COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN and/or SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF: Last Year	THIS YEAR'S SNOW WATER AS PERCENT OF: Average
East Kootenay/BC.	16	95	96
Kootenai/Montana	13	114	97
Kootenai above Bonners Ferry...	29	105	97
Little Bitterroot	--	---	---
N. Fk. Flathead..	9	122	98
M. Fk. Flathead..	6	86	86
S. Fk. Flathead..	7	92	93
Swan	3	100	95
Flathead	25	102	93
Stillwater & Whitefish	1	116	86
Clark Fork above Blackfoot	24	77	79
Blackfoot	14	69	72
Upper Clark Fork above Missoula	38	73	76
Bitterroot	8	72	87
Lower Clark Fork below Missoula	12	92	89
Clark Fork (Total w/o Flathead)...	58	80	83
Pend O'Reille (Clark Fork & Flathead)	83	88	87
Columbia (Pend O'Reille & Kootenai)	87	88	88

Clear, cool nights and moisture combine to form frost on vegetation in river bottoms. However, most areas need good snowfall for the next few months to bring snowpack levels up to normal.



Missouri River & Hudson Bay Drainages

STREAMFLOW FORECASTS

BASIN STREAM and/or FORECAST POINT	PERIOD	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average
		April - September				April - July			
RED ROCK RIVER near Monida (1)		126	114	150	110	118	115	135	103
BEAVERHEAD RIVER near Grant (2)		175	102	228	171	155	105	194	148
BEAVERHEAD RIVER at Barratts (2)		225	100		226	197	101		196
RUBY RIVER near Alder		103	98		105	88.0	99		89.0
BIG HOLE RIVER near Melrose		680	86		792	630	86		730
BOULDER RIVER near Boulder		Streamflow measurements discontinued			103				96.7
WILLOW CREEK near Harrison		17.3	80		21.5	15.5	81		19.2
MADISON RIVER near Grayling (3)		532	102	584	523	420	103	456	409
MADISON RIVER near McAllister (4)		850	96	1024	892	682	97	797	706
GALLATIN RIVER near Gateway		508	89		572	438	90		488
INFLOW MIDDLE CREEK RESERVOIR near Bozeman (5)		24.3	80		30.3	21.0	80		26.2
HYALITE CREEK near Bozeman (6)		38.0	80		47.4	32.9	80		41.0
GALLATIN RIVER at Logan		535	82		649	458	82		557
MISSOURI RIVER at Toston (7)		2345	88	3470	2,671	2050	88	3072	2,330
SHEEP CREEK near White Sulphur Springs		16.2	71	24.5	22.8	13.9	70	21.0	19.8
SUN RIVER at Gibson Dam (8)		410	71	596	580	370	70	544	529
BELT CREEK near Monarch		104	71		146	95.0	71		134
MISSOURI RIVER at Fort Benton (9)		3450	83		4,148	3020	83		3,640
TWO MEDICINE CREEK near Browning (10)		208	80		259	196	80		244
BADGER CREEK near Browning		108	81		133	93.0	80		116
MARIAS RIVER near Shelby		445	77	521	577	415	78	494	532
MISSOURI RIVER at Virgelle (11)		3945	82		4,793	3470	82		4,238
MISSOURI RIVER near Landusky (11)		4375	84		5,214	3850	84		4,586
NORTH FORK MUSSELSHELL RIVER near Delpine		4.1	64		6.4	3.4	62		5.5
SOUTH FORK MUSSELSHELL RIVER above Martinsdale		38.0	62		61.5	34.5	60		57.6
MISSOURI RIVER below Fort Peck Dam (11)		4080	83		4,929	3640	83		4,381
MILK RIVER at Eastern Crossing		245*	88		278*				
MILK RIVER at Eastern Crossing (12)		88.8*	80		111*				
INFLOW LAKE SAKAKAWEA, ND (11)		11030	82		13,450	10,040	82		12,239
SASKATCHEWAN RIVER BASIN									
SWIFTCURRENT CREEK at Sherburne (13)		126	95	133	132	110	96	117	115
ST. MARY'S RIVER near Babb (13)		470	94		498	405	95		426

*March-September forecast

(1) Adjusted for storage in Lima Reservoir.
(2) Adjusted for storage in Lima and Clark Canyon Reservoirs.
(3) Adjusted for storage in Hebgen Lake.
(4) Adjusted for storage in Hebgen Lake and Ennis Lake.
(5) Sum of West Fork Hyalite Creek and East Fork Hyalite Creek above the Reservoir.
(6) Adjusted for storage in Middle Creek Reservoir.
(7) Adjusted for storage in Lima, Hebgen, Ennis & Clark Canyon Reservoirs.
(8) Adjusted for storage in Gibson Reservoir & diversions.
(9) Adjusted for storage in Lima, Clark Canyon, Hebgen, Ennis, Gibson, Fishkun, Willow Creek & Canyon Ferry Reservoirs.
(10) Adjusted for storage in Two Medicine Reservoir & diversions in Two Medicine Canal.
(11) Adjusted for all upstream reservoirs.
(12) Flow at Eastern Crossing minus St. Mary's Canal
(13) Adjusted for storage in Lake Sherburne

ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

WATER SUPPLY OUTLOOK

Expressed as "Poor, Fair, Average, Excellent" With Respect to Usual Supply

STREAM or AREA	Flow Period Spring Season	Flow Period Late Season
Beaverhead	Exc	Avg
Ruby	Avg	Avg
Big Hole	Fair	Fair
Boulder	Fair	Fair
Jefferson	Fair	Fair
Madison	Avg	Avg
Gallatin	Avg	Fair
West-Side Missouri	Fair	Fair
Smith-Belt	Fair	Fair
Sun	Fair	Poor
Teton	Fair	Poor
Marias	Fair	Poor
Judith	Poor	Poor
Musselshell	Poor	Poor
Milk	Fair	Fair
Bear Paws	Fair	Fair
St. Mary's	Avg	Avg

Most runoff poor

Most streamflow is forecast to be 70 to 85 percent of average during the spring and summer months. If present weather patterns continue, even lower flows can be expected. The only areas that can expect near average runoff are the Red Rock, Beaverhead, Ruby and Madison Rivers in southwest Montana and the St. Mary's River with headwaters in Glacier National Park.

Runoff from central Montana is forecast to be around 60 to 70 percent of average based on current snowpack and soil moisture conditions.

Irrigation water supplies from streams not having stored water could become quite short unless weather patterns change toward increased moisture over the next three months.

SUMMARY of SNOW MEASUREMENTS

(COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN and/or SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF Last Year	THIS YEAR'S SNOW WATER AS PERCENT OF Average
Beaverhead	9	107	119
Ruby	2	87	97
Big Role	8	78	92
Boulder	10	89	85
Jefferson	29	91	100
Madison	16	87	96
Gallatin	15	79	74
Missouri Headwater	60	87	91
West-side Missouri (Toston-Cacade)	7	92	87
Smith-Belt-Arrow	3	60	61
Missouri Main-stem	13	73	72
Teton & Sun	2	67	72
Marias	3	73	78
Marias-Teton-Sun	5	71	76
Judith-Musselshell	3	60	61
Milk	7	78	82
Bear Paws	6	78	69
Missouri (Total)	81	83	86
Saskatchewan			
St. Mary's	2	97	94
Bow River in Alberta	--	---	---

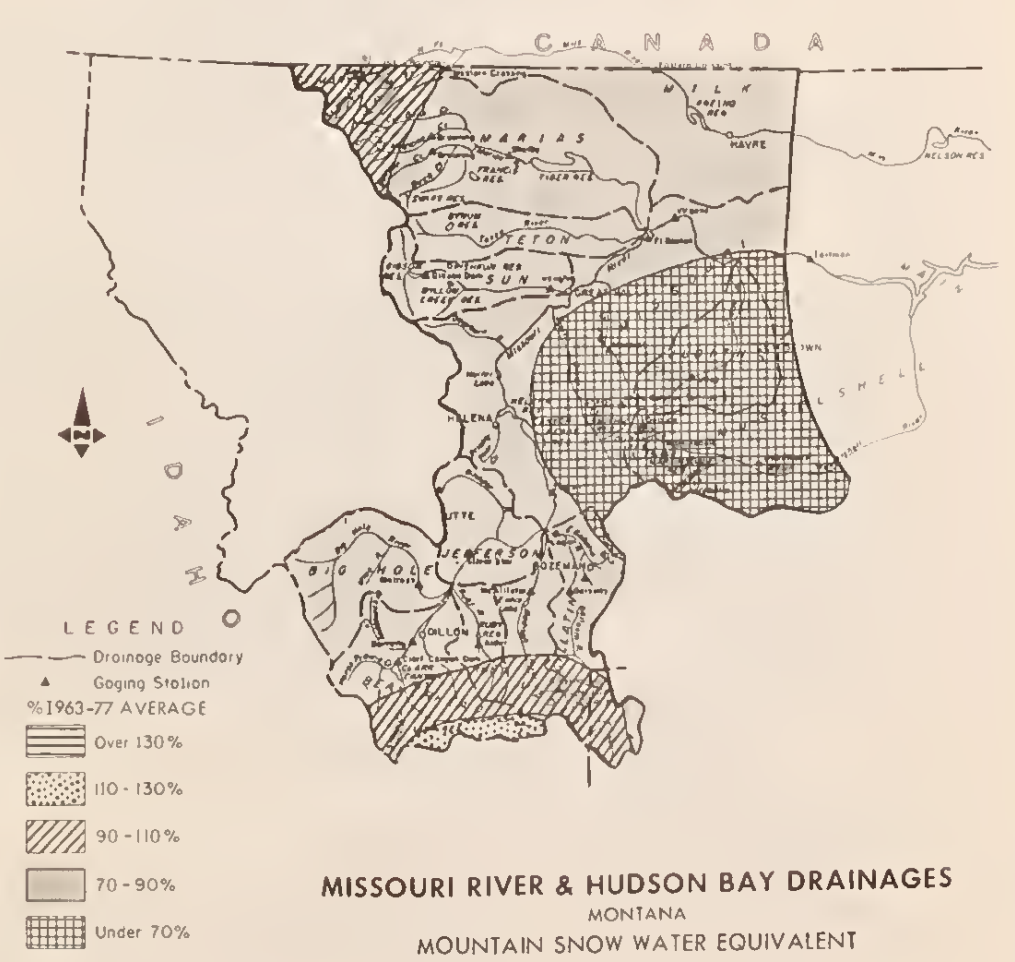
Snowpack variable

Snowfall during January was well below average in most areas. Currently, the snowpack varies from above average in the Red Rock River headwaters in southwest Montana to well below average in the smaller mountain ranges of central Montana. Most of the area is below average.

Parts of the Madison, Ruby and St. Mary's River headwaters are near average, but snow water equivalent in most drainages is below average.

The weather patterns that existed since early January have not brought any significant moisture to either the mountain or valley areas. This period has also been accompanied by moderate temperatures.

Missouri River headwaters have snowpack that varies from average in the southwest to well below average in central Montana.

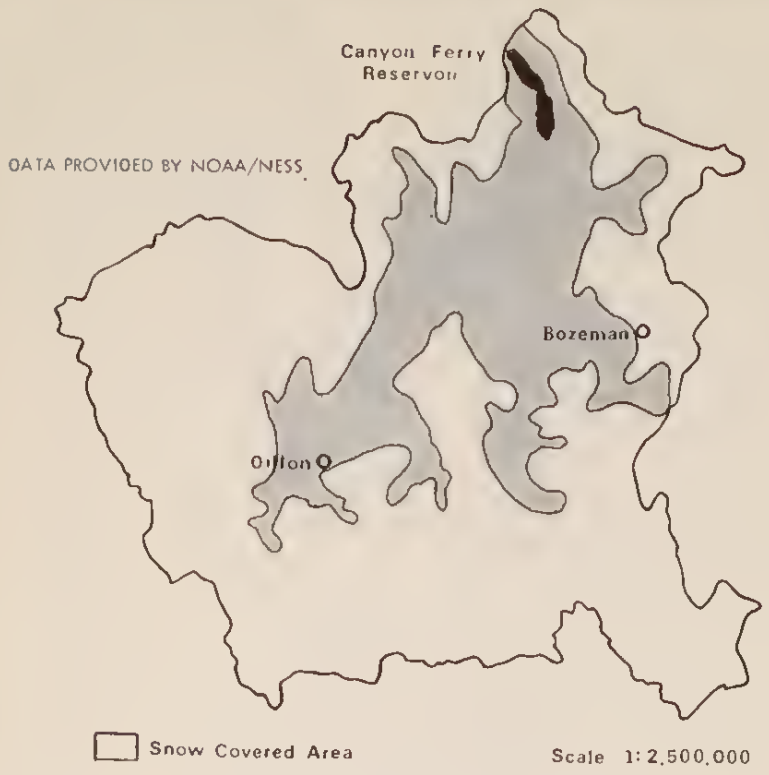


MISSOURI RIVER & HUDSON BAY DRAINAGES
MONTANA
MOUNTAIN SNOW WATER EQUIVALENT

RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH January 31, 1983

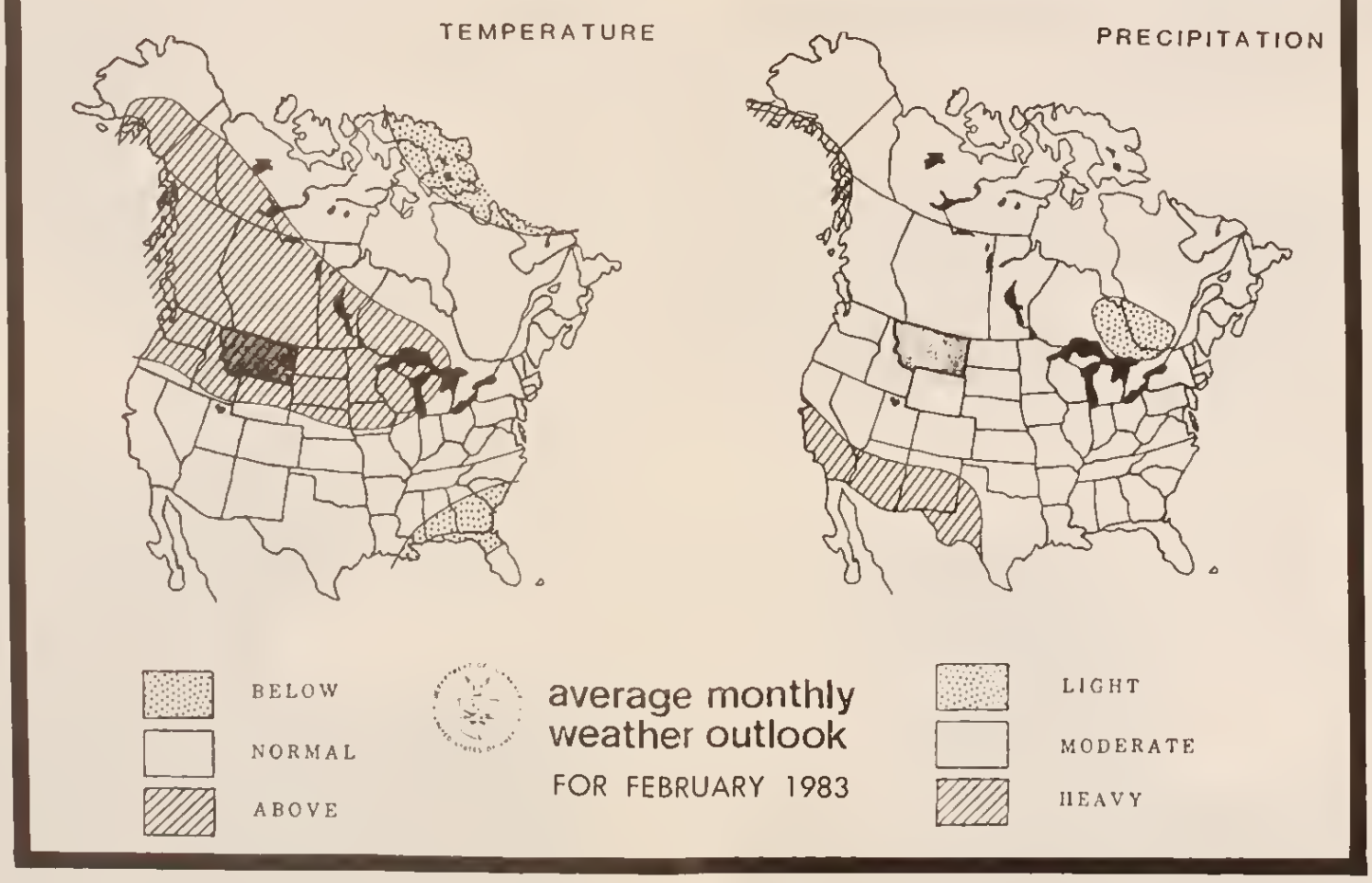
Basin or area	RESERVOIR	Usable Capacity	Usable Storage This Year	Usable Storage Last Year	Usable Storage Average
	COLUMBIA				
Kootenai	Koocanusa	5,748.2	2,732.0	2,717.0	---
Flathead	Hungry Horse	3,451.0	3,062.0	2,381.0	2,341.0
	Flathead Lake	1,791.0	973.8	887.0	1,253.0
	Camas (4)	45.2	29.9	20.0	20.7
	Mission Valley (8)	100.3	43.2	22.4	37.0
Clark Fork	Georgetown Lake	31.0	28.1	15.0	27.3
	Lower Willow Creek	4.9	1.4	1.2	1.6
	Nevada Creek	12.6	---	---	5.0
	Noxon Rapids	334.6	321.1	320.1	315.2
Bitterroot	Painted Rocks	31.7	---	---	17.6
	Como	34.9	---	7.8	11.3
	MISSOURI				
Beaverhead	Lima	84.0	49.9	25.6	39.5
	Clark Canyon	257.2	169.0	158.5	135.9
Ruby	Ruby	38.8	26.0	---	24.3
Madison	Hebgen Lake	377.5	274.2	274.6	241.5
	Ennis Lake	41.0	32.1	31.4	35.3
Gallatin	Middle Creek	8.0	3.7	3.5	3.3
Missouri	Canyon Ferry	2,043.0	1,762.0	1,590.0	1,661.0
	Hauser & Helena	61.9	63.0	61.9	60.2
	Lake Helena	10.4	10.9	10.4	9.9
	Holter Lake	81.9	81.0	81.4	70.8
	Fort Peck Lake	18,910.0	16,110.0	14,180.0	15,570.0
Smith	Smith River	10.6	8.0	6.0	6.7
	Newlan Creek	12.4	8.7	10.3	---
Musselshell	Bair	7.0	6.1	2.8	4.4
	Martinsdale	23.1	16.3	10.8	9.9
	Deadman's Basin	72.2	---	---	46.8
Sun	Gibson	99.1	58.6	44.5	41.4
	Willow Creek	32.2	23.9	22.8	21.2
	Pishkun	32.0	20.1	19.8	16.5
Marias	Lower Two Medicine	11.9	---	---	6.2
	Four Horns	19.2	---	---	13.2
	Swift	30.0	13.5	7.6	14.3
	Lake Frances	111.9	85.5	77.8	70.9
Milk	Elwell (Tiber)	1,347.0	691.0	505.7	540.8
	Beaver Creek	3.5	3.0	0.8	1.5
	Fresno	127.2	13.3	32.2	65.4
	Nelson	66.8	46.7	28.8	43.3
	HUDSON BAY				
St. Mary's	Lake Sherburne	64.3	34.2	14.6	20.1
	YELLOWSTONE				
Stillwater	Mystic Lake	21.0	6.3	6.1	10.0
Clark's Fork	Cooney	27.4	16.0	---	14.6
Tongue	Tongue River	68.0	26.4	18.1	32.5
Bighorn	Bighorn Lake	1,356.0	965.5	882.5	536.0

SATELLITE SNOW COVER



MISSOURI RIVER BASIN
Above
Canyon Ferry Dam

DATE	PERCENT SNOW COVER	AVERAGE SNOWLINE ELEVATION IN FEET
November 14, 1982	81	5290
November 1982	96	4300
November 24, 1982	95	4380
December 24, 1982	100	3800
January 18, 1983	76	5540
January 25, 1983	71	5770



AGENCIES AND ORGANIZATIONS COOPERATING IN MONTANA SNOW SURVEYS

GOVERNMENT AGENCIES
- Canada
  - Department of the Environment
    - Atmospheric Environment Service
    - Water Management Service
  - British Columbia Ministry of Environment
    - Inventory and Engineering Branch, Hydrology Section
  - Alberta Environment
    - Technical Services Division
- Federal
  - Department of the Army - Corps of Engineers
  - Department of Agriculture - Forest Service
  - Department of Agriculture - Soil Conservation Service
  - Department of Commerce - National Environmental Satellite Service
  - Department of Commerce - National Weather Service
  - Department of Interior - Bureau of Indian Affairs
  - Department of Interior - Fish and Wildlife Service
  - Department of Interior - Geological Survey
  - Department of Interior - National Park Service
  - Department of Interior - Bureau of Reclamation
  - Department of Energy - Bonneville Power Administration

STATE AGENCIES
- Montana Conservation Districts
- Montana Department of Fish, Wildlife and Parks
- Montana Department of Natural Resources and Conservation
- Montana State University - Agricultural Experiment Station
- University of Montana - School of Forestry

PRIVATE ORGANIZATIONS
- The Anaconda Company
- Big Sky of Montana
- Butte Water Company
- Flathead Valley Community College
- Montana Power Company

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

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